

CLAIMS

- 1 1. A heads-up display system for an aircraft having a rotating propeller within view of at
2 least one occupant of the aircraft, the heads-up display system comprising:
3 a plurality of light-emitting elements disposed on a side of a propeller blade
4 substantially facing at least one occupant of the aircraft; and
5 a graphics generator controlling illumination of one or more of the light-emitting
6 elements on the side of the propeller blade in accordance with the rotation of the
7 propeller to produce at least one graphical image that appears to at least one occupant of
8 the aircraft to be superimposed on a background.
- 1 2. The heads-up display system of claim 1, wherein the at least one graphical image
2 conforms to an object in the background upon which that graphical image is
3 superimposed.
- 1 3. The heads-up display system of claim 1, wherein one of the light-emitting elements,
2 when illuminated, produces a narrow beam of light that is visible to each occupant within
3 a radiation pattern of the light and is unseen by each occupant outside of the radiation
4 pattern.
- 1 4. The heads-up display system of claim 1, wherein one of the light-emitting elements,
2 when illuminated, produces a wide beam of light visible simultaneously to multiple
3 occupants of the aircraft with a view of the propeller.

- 1 5. The heads-up display system of claim 1, further comprising a data processor obtaining
2 information from aircraft sensors and generating a command based on the information for
3 use in generating the graphical image.
- 1 6. The heads-up display of claim 1, further comprising a communication channel between a
2 processor in an airframe of the aircraft and the propeller for transferring signals between
3 the processor and the graphics generator.
- 1 7. The heads-up display of claim 6, wherein the communication channel is a wireless
2 channel.
- 1 8. The heads-up display of claim 6, wherein the communication channel is a wired channel.
- 1 9. The heads-up display of claim 8, wherein the communication channel includes a slip ring.
- 1 10. The heads-up display of claim 1, further comprising a processor translating electrical
2 signals obtained from a sensor of the aircraft into a command to be sent to the graphics
3 generator for producing the graphical image.
- 1 11. The heads-up display of claim 1, further comprising a power source supplying power to
2 graphics generator.
- 1 12. The heads-up display of claim 11, wherein the power source is derived from the rotation
2 of the propeller.
- 1 13. The heads-up display of claim 1, wherein the propeller blade is a first propeller blade,
2 and further comprising a second plurality of light-emitting elements disposed on a side of

3 a second propeller blade of the propeller substantially facing at least one occupant of the
4 aircraft and emitting light in accordance with the rotation of the propeller to produce at
5 least one graphical image that appears to at least one occupant to be superimposed on the
6 background.

1 14. The heads-up display of claim 13, wherein the at least one graphical image produced by
2 the second plurality of light-emitting elements is redundant to the at least one graphical
3 image produced by the plurality of light-emitting elements on the first propeller blade.

1 15. An aircraft, comprising:

2 a propeller having a plurality of propeller blades;

3 an array of light-emitting elements disposed on a side of one or more of the
4 propeller blades; and

5 a graphics generator controlling illumination of one or more of the light-emitting
6 elements in the array of light-emitting elements disposed on the side of one of the
7 propeller blades in accordance with a rotation of the propeller, to produce a display of a
8 graphical image.

1 16. The aircraft of claim 15, further comprising a processor obtaining information from
2 aircraft instrumentation and sending a command based on the information to the graphics
3 generator over a communication channel to control the display of the graphical image.

1 17. The aircraft of claim 16, wherein the communication channel is one of a wireless channel
2 and a wired channel.

- 1 18. The aircraft of claim 15, further comprising a power generator generating from the
2 rotation of the propeller a source of power that is supplied to the graphics generator.
- 1 19. A propeller, comprising:
2 a propeller blade;
3 a plurality of light-emitting elements disposed on a side of the propeller blade;
4 and
5 a spinner having a graphics generator in communication with the plurality of
6 light-emitting elements to control illumination of one or more of the light-emitting
7 elements in accordance with a rotation of the propeller.
- 1 20. The propeller of claim 19, further comprising a propeller-position sensor determining a
2 current angular position of the propeller and communicating the current angular position
3 to the graphics generator.
- 1 21. An apparatus for use in a craft having a rotating propeller, the apparatus comprising:
2 a light source disposed on a side of a blade of the propeller;
3 means for determining a current rotational position of the propeller; and
4 means for controlling illumination of the light source based on the current
5 rotational position of the propeller.
- 1 22. The apparatus of claim 21, further comprising means for generating power from the
2 rotation of the propeller and providing the generated power to the means for controlling
3 illumination of the light source.

1 23. A method of producing a heads-up display for an aircraft with a rotating propeller, the
2 method comprising:

3 providing a plurality of light-emitting elements on a side of a propeller blade;

4 determining a current rotational position of the propeller; and

5 controlling illumination of the plurality of the light-emitting elements based on
6 the current rotational position of the propeller.

1 24. The method of claim 23, further comprising obtaining information from instrumentation
2 of the aircraft, and wherein the step of controlling illumination causes display of a
3 graphical image based on the obtained information during the rotation of the propeller.